



1652

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1600

DATE: 03/07/2002 R.6  
TIME: 15:12:25

RAW SEQUENCE LISTING  
PATENT APPLICATION: US/09/995,587A

Input Set : A:\Bo43667.app  
Output Set: N:\CRF3\03072002\I995587A.raw

3 <110> APPLICANT: VAN HIJUM, SACHA ADRIANUS FOKKE TACO  
4 VAN GEEL-SCHUTTEN, GERRITDINA HENDRIKA  
5 DIJKHUIZEN, LUBBERT  
6 RAHAOUI, HAKIM  
8 <120> TITLE OF INVENTION: NOVEL FRUCTOSYLTRANSFERASES  
10 <130> FILE REFERENCE: B043667-CIP  
12 <140> CURRENT APPLICATION NUMBER: 09/995,587A  
C--> 13 <141> CURRENT FILING DATE: 2002-02-28  
15 <150> PRIOR APPLICATION NUMBER: 09/604,958  
16 <151> PRIOR FILING DATE: 2000-06-28  
18 <150> PRIOR APPLICATION NUMBER: EPO 00201872.9  
19 <151> PRIOR FILING DATE: 2000-05-25  
21 <160> NUMBER OF SEQ ID NOS: 40  
23 <170> SOFTWARE: PatentIn Ver. 2.1  
25 <210> SEQ ID NO: 1  
26 <211> LENGTH: 789  
27 <212> TYPE: PRT  
28 <213> ORGANISM: Lactobacillus reuteri  
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34 Ala Leu Val Phe Gly Ala Thr Thr Val Asn Ala Ser Ala Asp Thr Asn  
35 20 25 30  
37 Ile Glu Asn Asn Asp Ser Ser Thr Val Gln Val Thr Thr Gly Asp Asn  
38 35 40 45  
40 Asp Ile Ala Val Lys Ser Val Thr Leu Gly Ser Gly Gln Val Ser Ala  
41 50 55 60  
43 Ala Ser Asp Thr Thr Ile Arg Thr Ser Ala Asn Ala Asn Ser Ala Ser  
44 65 70 75 80  
46 Ser Ala Ala Asn Thr Gln Asn Ser Asn Ser Gln Val Ala Ser Ser Ala  
47 85 90 95  
49 Ala Ile Thr Ser Ser Thr Ser Ala Ala Ser Leu Asn Asn Thr Asp  
50 100 105 110  
52 Ser Lys Ala Ala Gln Glu Asn Thr Asn Thr Ala Lys Asn Asp Asp Thr  
53 115 120 125  
55 Gln Lys Ala Ala Pro Ala Asn Glu Ser Ser Glu Ala Lys Asn Glu Pro  
56 130 135 140  
58 Ala Val Asn Val Asn Asp Ser Ser Ala Ala Lys Asn Asp Asp Gln Gln  
59 145 150 155 160  
61 Ser Ser Lys Lys Asn Thr Thr Ala Lys Leu Asn Lys Asp Ala Glu Asn  
62 165 170 175  
64 Val Val Lys Lys Ala Gly Ile Asp Pro Asn Ser Leu Thr Asp Asp Gln  
65 180 185 190

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Input Set : A:\Bo43667.app

Output Set: N:\CRF3\03072002\I995587A.raw

67 Ile Lys Ala Leu Asn Lys Met Asn Phe Ser Lys Ala Ala Lys Ser Gly  
 68 195 200 205  
 70 Thr Gln Met Thr Tyr Asn Asp Phe Gln Lys Ile Ala Asp Thr Leu Ile  
 71 210 215 220  
 73 Lys Gln Asp Gly Arg Tyr Thr Val Pro Phe Phe Lys Ala Ser Glu Ile  
 74 225 230 235 240  
 76 Lys Asn Met Pro Ala Ala Thr Thr Lys Asp Ala Gln Thr Asn Thr Ile  
 77 245 250 255  
 79 Glu Pro Leu Asp Val Trp Asp Ser Trp Pro Val Gln Asp Val Arg Thr  
 80 260 265 270  
 82 Gly Gln Val Ala Asn Trp Asn Gly Tyr Gln Leu Val Ile Ala Met Met  
 83 275 280 285  
 85 Gly Ile Pro Asn Gln Asn Asp Asn His Ile Tyr Leu Leu Tyr Asn Lys  
 86 290 295 300  
 88 Tyr Gly Asp Asn Glu Leu Ser His Trp Lys Asn Val Gly Pro Ile Phe  
 89 305 310 315 320  
 91 Gly Tyr Asn Ser Thr Ala Val Ser Gln Glu Trp Ser Gly Ser Ala Val  
 92 325 330 335  
 94 Leu Asn Ser Asp Asn Ser Ile Gln Leu Phe Tyr Thr Arg Val Asp Thr  
 95 340 345 350  
 97 Ser Asp Asn Asn Thr Asn His Gln Lys Ile Ala Ser Ala Thr Leu Tyr  
 98 355 360 365  
 100 Leu Thr Asp Asn Asn Gly Asn Val Ser Leu Ala Gln Val Arg Asn Asp  
 101 370 375 380  
 103 Tyr Ile Val Phe Glu Gly Asp Gly Tyr Tyr Tyr Gln Thr Tyr Asp Gln  
 104 385 390 395 400  
 106 Trp Lys Ala Thr Asn Lys Gly Ala Asp Asn Ile Ala Met Arg Asp Ala  
 107 405 410 415  
 109 His Val Ile Glu Asp Gly Asn Gly Asp Arg Tyr Leu Val Phe Glu Ala  
 110 420 425 430  
 112 Ser Thr Gly Leu Glu Asn Tyr Gln Gly Glu Asp Gln Ile Tyr Asn Trp  
 113 435 440 445  
 115 Leu Asn Tyr Gly Gly Asp Asp Ala Phe Asn Ile Lys Ser Leu Phe Arg  
 116 450 455 460  
 118 Ile Leu Ser Asn Asp Asp Ile Lys Ser Arg Ala Thr Trp Ala Asn Ala  
 119 465 470 475 480  
 121 Ala Ile Gly Ile Leu Lys Leu Asn Lys Asp Glu Lys Asn Pro Lys Val  
 122 485 490 495  
 124 Ala Glu Leu Tyr Ser Pro Leu Ile Ser Ala Pro Met Val Ser Asp Glu  
 125 500 505 510  
 127 Ile Glu Arg Pro Asn Val Val Lys Leu Gly Asn Lys Tyr Tyr Leu Phe  
 128 515 520 525  
 130 Ala Ala Thr Arg Leu Asn Arg Gly Ser Asn Asp Asp Ala Trp Met Asn  
 131 530 535 540  
 133 Ala Asn Tyr Ala Val Gly Asp Asn Val Ala Met Val Gly Tyr Val Ala  
 134 545 550 555 560  
 136 Asp Ser Leu Thr Gly Ser Tyr Lys Pro Leu Asn Asp Ser Gly Val Val  
 137 565 570 575  
 139 Leu Thr Ala Ser Val Pro Ala Asn Trp Arg Thr Ala Thr Tyr Ser Tyr

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Input Set : A:\Bo43667.app

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143	595	600	605
145	Tyr Met Thr Asn Arg Asn Gly Val Ala Gly Lys Gly Met Asp Ser Thr		
146	610	615	620
148	Trp Ala Pro Ser Phe Leu Leu Gln Ile Asn Pro Asp Asn Thr Thr Thr		
149	625	630	635
151	Val Leu Ala Lys Met Thr Asn Gln Gly Asp Trp Ile Trp Asp Asp Ser		640
152	645	650	655
154	Ser Glu Asn Leu Asp Met Ile Gly Asp Leu Asp Ser Ala Ala Leu Pro		
155	660	665	670
157	Gly Glu Arg Asp Lys Pro Val Asp Trp Asp Leu Ile Gly Tyr Gly Leu		
158	675	680	685
160	Lys Pro His Asp Pro Ala Thr Pro Asn Asp Pro Glu Thr Pro Thr Thr		
161	690	695	700
163	Pro Glu Thr Pro Glu Thr Pro Asn Thr Pro Lys Thr Pro Lys Thr Pro		
164	705	710	715
166	Glu Asn Pro Gly Thr Pro Gln Thr Pro Asn Thr Pro Asn Thr Pro Glu		720
167	725	730	735
169	Ile Pro Leu Thr Pro Glu Thr Pro Lys Gln Pro Glu Thr Gln Thr Asn		
170	740	745	750
172	Asn Arg Leu Pro Gln Thr Gly Asn Asn Ala Asn Lys Ala Met Ile Gly		
173	755	760	765
175	Leu Gly Met Gly Thr Leu Leu Ser Met Phe Gly Leu Ala Glu Ile Asn		
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178	Lys Arg Arg Phe Asn		
179	785		
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183	<211> LENGTH: 2367		
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185	<213> ORGANISM: Lactobacillus reuteri		
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190	gtacaaggta caacaggtga taatgatatt gctgtaaaaa gtgtgacact tggtagtggt 180		
191	caagtttagt cagctagtga tacgactatt agaacttctg ctaatgc当地 tagtgc当地 240		
192	tctgccgcta atacacaaaa ttctaacagt caagtagcaa gttctgctgc aataacatca 300		
193	tctacaagtt ccgcagcttc attaaataac acagatagta aagcggctca agaaaatact 360		
194	aatacagcca aaaatgatga cacgcaaaaaa gctgcaccag ctaacgaatc ttctgaagct 420		
195	aaaaatgaac cagctgtaaa ctgttaatgtat tcttcagctg caaaaaatga tgatcaacaa 480		
196	tccagtaaaa agaataactac cgctaaagtta aacaaggatg ctgaaaacgt tgtaaaaaag 540		
197	gcccccaattt atcctaacag tttaactgtat gaccagatta aagcattttaa taagatgaac 600		
198	ttctcgaaag ctgcaaaatgc tggtagccaa atgacttata atgatttcca aaagattgct 660		
199	gatacgtaa tcaaacaaga tggtcggatc acagttccat tctttaaagc aagtggaaatc 720		
200	aaaaatatgc ctggcgctac aactaaagat gcacaaacta atactattga acctttagat 780		
201	gtatgggatt catggcagt tcaagatgtt cggacaggac aagttgctaa ttggaaatggc 840		
202	tatcaacttg tcatcgcaat gatggaaatt ccaaaccaaa atgataatca tatctatctc 900		
203	ttatataata agtatgtga taatgaatta agtcatggaa agaatgtagg tccaattttt 960		
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Input Set : A:\Bo43667.app

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 206 aaaattgcta ggcgtactt ttatttaact gataataatg gaaatgtatc actcgcttag 1140  
 207 gtacgaaaatg acttatattgt atttgaaggt gatggctatt actaccaaac ttatgatcaa 1200  
 208 tggaaagcta ctaacaaagg tgccgataat attgcaatgc gtatgtctca tggtaattgaa 1260  
 209 gatggtaatg gtgatcggtt ccttggttt gaagcaagta ctgggttggaa aaattatcaa 1320  
 210 ggcgaggacc aaatttataa ctggtaaat tatggcggag atgacgcatt taatatcaag 1380  
 211 agcttattta gaattcttc caatgatgat attaagagtc gggcaacttg ggctaatgca 1440  
 212 gctatcggtt ccctcaaact aaataaggac gaaaagaatc ctaagggtggc agagttatac 1500  
 213 tcaccattaa tttctgcacc aatggtaagc gatgaaattt agcgaccaaaa tggtagttaaa 1560  
 214 ttaggtataa aatattactt atttgcgtt acccgtaatc atcgaggaag taatgatgat 1620  
 215 gcttggatga atgctaatta tgccgttgg gataatgttgc caatggtcgg atatgttgc 1680  
 216 gatagtctaa ctggatctta taagccatata aatgatttgc gaggtagtctt gactgttct 1740  
 217 gttccctgcaaa actggcggac agcaacttat tcattttatgc ctgtccccgt tggccggaaaa 1800  
 218 gatgaccaag tattagttac ttcatatatac actaataagaa atggagtagc gggtaaagga 1860  
 219 atggattcaa cttgggcacc gagtttctta ctacaaattt acccgatata cacaactact 1920  
 220 gttttagcta aaatgactaa tcaaggggat tggatttggg atgattcaag cgaaaatctt 1980  
 221 gatatgattt gtgattttaga ctccgctgtt ttacctggcg aacgtgatata acctgttgat 2040  
 222 tgggacttaa ttgggtatgg attaaaacccg catgatcctg ctacaccaaa tgatcctgaa 2100  
 223 acgccaacta caccagaaac ccctgagaca cctaataactc cccaaacacc aaagactct 2160  
 224 gaaaatcctg ggacacctca aactcctaatac acaccataa ctccggaaat tccttaact 2220  
 225 ccagaaaacgc ctaagcaacc tggaaacccaa actaataatc gtttgcaca aactggaaat 2280  
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 238 aatattgaaa acaatgatcc ttctactgtt caagttacaa caggtgataa tgatattgtt 180  
 239 gttaaaatgt tgacacttgg tagtggtaa gttatgtcag ctatgtatc gactatttgg 240  
 240 acttctgtca atgcaaatag tgcttcttgc gccgctaata cacaatattt taacagtcaa 300  
 241 gtagcaagtt ctgctgaat aacatcatct acaagttccg cagcttcatc aaataacaca 360  
 242 gatagtaaaag cggctcaaga aaataactaat acagccaaaa atgatgacac gcaaaaagct 420  
 243 gcaccagctt acgaatctt tgaagctaaa aatgaaccag ctgtaaacgt taatgattct 480  
 244 tcagctgcaaa aatgtatgttcaacaaatcc agtaaaaaga atactaccgc taagttaaac 540  
 245 aaggatgttggt aaaaacgttggt aaaaaggcg ggaattgtatc ctaacagttt aactgtatgac 600  
 246 cagattaaag cattaaataa gatgaaacttc tcgaaagctg caaagtctgg tacacaaatg 660  
 247 acttataatgttccaaaatgatttgcgtat acgttaatca aacaagatgg tcggtagacaca 720  
 248 gttccattct ttaaagcaag tggaaatcaaa aatatgccttgc cccgtacaaac taaagatgca 780  
 249 caaactataa ctattgaacc tttagatgttgc tggatttcat gcccagttca agatgttccg 840  
 250 acaggacaag ttgctaatttgcgtat caacttgtca tcgcaatgtatc gggaaattcca 900  
 251 aacccaaaatg ataatcatat ctatcttataa tataataatgttgcgtat tgaatattgtt 960  
 252 cattggaaatgtatgttcc aatttttggc tataatttca cccgttccatc acaagaatgg 1020  
 253 tcaggatcgtt ctgtttggaa cagtgtatcact tctatgttgc tttttatc aagggttagac 1080  
 254 acgtctgtatc acaataccaa tcatcaaaaa attgtatgttgc ctactcttta ttatgtatc 1140  
 255 aataatggaa atgtatcatc cgctcaggta cgaaatgtact atattgttgc tgaaggttgc 1200  
 256 ggcttattactt accaaacttgc tttatgttgc aagctacta acaaaggttgc cgataatattt 1260

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 259 ggcggagatg acgcattaa tatcaagagc ttatttagaa ttcttccaa tgatgatatt 1440  
 260 aagagtcggg caacttggc taatcgact atcggtatcc tcaaactaaa taaggacgaa 1500  
 261 aagaatccca aggtggcaga gtiatactca ccattaattt ctgcaccaat ggttaagcgat 1560  
 262 gaaattgagc gaccaaattt agttaaatta ggtataataat attacttatt tgccgctacc 1620  
 263 cgtttaatc gaggaagtaa tgatgatgct tggatgaatg ctaattatgc cggttgtat 1680  
 264 aatgttgc aa tggtcggata tggtcgtat agtctaactg gatottataa gccattaaat 1740  
 265 gattctggag tagtcttgac tgcttctgtt cctgcaaact ggcggacagc aacttattca 1800  
 266 tattatgctg tccccgttgc cgaaaagat gaccaagat tagttacttc atatatgact 1860  
 267 aatagaaatg gagtagcggg taaaggaatg gattcaactt gggcacccgag ttttacta 1920  
 268 caaattaacc cggataaacac aactacttt ttagctaaaa tgactaatca aggggattgg 1980  
 269 atttgggatg attcaagcga aaatcttgcgat atgattggtg atttagactc cgctgctta 2040  
 270 cctggcgaac gtgataaaacc tggattgg gacttaattt gttatggatt aaaaccgcat 2100  
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 272 aatactccca aaacacccaa gactcctgaa aatcctggg cacctcaaac tcctaataca 2220  
 273 cctaatactc cgaaaattcc ttaactcca gaaacgccta agcaacctga aacccaaact 2280  
 274 aataatcggtt tgccacaaac tggaaataat gccaataaaag ccatgattgg cctaggtatg 2340  
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 285 <222> LOCATION: (1)..(51)  
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 294 1 5 10 15  
 296 acg caaggaacat aaaaaa atg tat aaa agc ggt aaa aat tgg gca gtc gtt 100  
 297 Thr Met Tyr Lys Ser Gly Lys Asn Trp Ala Val Val  
 298 20 25  
 300 aca ctc tcg act gct gcg ctg gta ttt ggt gca aca act gta aat gca 148  
 301 Thr Leu Ser Thr Ala Ala Leu Val Phe Gly Ala Thr Thr Val Asn Ala  
 302 30 35 40  
 304 tcc gcg gac aca aat att gaa aac aat gat tct tct act gta caa gtt 196  
 305 Ser Ala Asp Thr Asn Ile Glu Asn Asn Asp Ser Ser Thr Val Gln Val  
 306 45 50 55 60  
 308 aca aca ggt gat aat gat att gct gtt aaa agt gtg aca ctt ggt agt 244  
 309 Thr Thr Gly Asp Asn Asp Ile Ala Val Lys Ser Val Thr Leu Gly Ser  
 310 65 70 75  
 312 ggt caa gtt agt gca gct agt gat acg act att aga act tct gct aat 292  
 313 Gly Gln Val Ser Ala Ala Ser Asp Thr Thr Ile Arg Thr Ser Ala Asn  
 314 80 85 90  
 316 gca aat agt gct tct gtc gct aat aca caa aat tct aac agt caa 340

RAW SEQUENCE LISTING ERROR SUMMARY                    DATE: 03/07/2002  
PATENT APPLICATION: US/09/995,587A                    TIME: 15:12:26

Input Set : A:\Bo43667.app  
Output Set: N:\CRF3\03072002\I995587A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:5; Xaa Pos. 3  
Seq#:10; N Pos. 2702,2703,2704,2705,2706,2707,3686,3687,3688,3689,3690,3691  
Seq#:10; N Pos. 3692,3693,3694,3695,3696,3697,3698  
Seq#:10; Xaa Pos. 495,496,737  
Seq#:11; Xaa Pos. 495,496,737  
Seq#:18; N Pos. 6,15  
Seq#:19; N Pos. 3,6,9,12  
Seq#:22; N Pos. 6,9,12,18,21  
Seq#:23; N Pos. 9,12,15,21  
Seq#:26; N Pos. 6,9

VERIFICATION SUMMARY  
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Input Set : A:\Bo43667.app  
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L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date  
L:514 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:0  
L:751 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:2692  
L:752 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:2740  
L:812 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:3460  
L:829 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:3658  
L:970 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:11 after pos.:480  
L:1018 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:11 after pos.:736  
L:1122 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:18 after pos.:0  
L:1154 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:19 after pos.:0  
L:1215 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22 after pos.:0  
L:1247 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:23 after pos.:0  
L:1288 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:26 after pos.:0